

REMARKS

Reconsideration and withdrawal of the rejection set forth in the Office Action dated April 15, 2005 is respectfully requested. Claims 1, 69-73, and 75-91 are currently pending this application.

**Allowed Claims**

The Examiner has allowed claim 1. The applicants thank the Examiner for pointing out allowable subject matter.

**The 112 Rejections (Written Description)**

The Examiner rejected claims 69-73 and 75-88 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

On page 2 of the Office action, the Examiner asserts, with respect to claim 69, that there is no "descriptive support" in the original specification for "producing oxides of iron and manganese by thermally reducing hydroxides of iron and manganese." The applicants respectfully disagree. In paragraph 22 of the application as published, by way of example but not limitation the applicants describe an embodiment in which: "Increasing the pH of the solution precipitates the iron and manganese hydroxides which are dried after isolation. The hydroxides are thermally decomposed at high temperature to yield iron and manganese oxides..." The applicants believe that the language in paragraph 22 satisfies the written description requirement for the language "thermally reducing hydroxides of iron and manganese to produce oxides of iron and manganese" of claim 69.

The Examiner asserts, with respect to claim 70, "there is no support for pretreating by adding zeolites." Claim 70 includes the language, "wherein said iron and manganese oxides are dispersed on zeolites." Support for this amendment is found in paragraph 21, and in paragraph 29, by way of example but not limitation, the applicants describe an embodiment with the following language: "About 7.5 grams of pulverized 13X zeolites were added after the solution had been diluted to about 1.0 liter and heated to about 60.degree. C." The applicants believe the amendment clarifies what is intended by the pretreatment step of adding zeolites. The amendment is not believed to limit the scope of claim 70.

The Examiner asserts, with respect to claims 71, 72, 76, 77, and 81, "there is no support for the temperature limitations recited therein." Claims 71 and 76 have been canceled without prejudice. The applicants reserve the right to reintroduce the claims. Claims 72 and 77 have been amended to clarify that the temperature in a specific example is 400 degrees C. The amendment is not intended to

The Examiner asserts, with respect to claims 73, 78, and 83, "there is no support for pretreating salts of iron and manganese to produce hydroxides of iron and manganese." Again, the applicants respectfully disagree. In paragraph 22 of the application as published, by way of example but not limitation the applicants describe "In one embodiment, manganese and iron acetates, chlorides or nitrates are dissolved in aqueous solvent and inert support is added." And later, in paragraph 29, "About 96.0 grams of ferric chloride hexahydrate (FeCl<sub>3</sub>.6H<sub>2</sub>O) and about 41.7 grams of manganese chloride tetrahydrate (MnCl<sub>2</sub>.4H<sub>2</sub>O) were dissolved in about 0.5 liters of distilled water. The solution was heated to about 50.degree. C. with stirring until the metal salts dissolved." The applicants believe the language in paragraph 22 or paragraph 29, whether considered together or separately, satisfies the

written description requirement for the language "pre-treating salts of iron and manganese to produce hydroxides of iron and manganese" of claim 73 and similar language in claims 78 and 83.

The Examiner asserts, with respect to claim 79 "there is no support for gettering 'at least' oxygen contaminants from the stream of ammonia." Again, the applicants respectfully disagree. In paragraph 19 of the application as published, by way of example but not limitation the applicants describe "According to a first aspect, the present invention provides a method for removing oxygen from ammonia gas contaminated with oxygen comprising contacting the oxygen contaminated ammonia gas with a getter material including iron and manganese that sorbs oxygen to yield ammonia that is substantially oxygen free (i.e., containing less than about 1 part per billion (ppb) of oxygen)." The applicants believe the language in paragraph 19 satisfies the written description requirement for the language "gettering at least oxygen contaminants from the stream of ammonia with the getter material" of claim 79.

The Examiner asserts, with respect to claim 82, "there is no support for providing zeolites in contact with the getter material." Again, the applicants respectfully disagree. In paragraph 21 of the application as published, by way of example but not limitation the applicants describe "In another embodiment, the getter material is dispersed on inert supports such as zeolites..." In paragraph 24, "In some embodiments, the drying agent is directly mixed with the getter material." In paragraph 30, "The gas purification device was then cooled to room temperature under a stream of argon to provide a getter material of iron and manganese supported on zeolite." The applicants believe the language in paragraphs 21, 24, and 30 provide examples that satisfy the written description requirement for the language "providing zeolites in contact with said getter material" of claim 82.

The Examiner asserts, with respect to claims 84-86, "there is no support for reducing the levels of oxygen to the recited values." Again, the applicants respectfully disagree. In paragraph 34 of the application as published, by way of example but not limitation the applicants describe:

The ability of the conditioned iron and manganese getter material to absorb oxygen was measured by flowing nitrogen containing 100 parts per million (ppm) of oxygen, at a rate of about 0.1 l/min at a pressure of about 3 bars through the gas purification device and analyzing the oxygen concentration of the effluent gas on an Osaka MK3Y instrument. The iron and manganese getter material was considered active if the oxygen concentration of the effluent gas was less than 1% of the oxygen concentration of the incoming gas. After seven days of gas flow the getter material was deactivated. The calculated absorption capacity of the iron and manganese getter material was determined by standard methods to be about 4 liters of oxygen for each liter of getter material (l/l ) which is significantly superior to the 1 l/l-2 l/l absorption achieved using the methods and materials of the prior art.

Thus, the oxygen in the pre-gettered flow was about 100 ppm and the oxygen concentration was at least 1% of that amount (i.e., less than about 1 ppm). Accordingly, the applicants believe the language in paragraph 34 satisfies the written description requirement for the language "after gettering oxygen from the stream of gaseous ammonia, there is less than about 1 ppm of oxygen in said ammonia gas" of claim 84. With respect to claim 85, in paragraph 19 the applicants describe "According to a first aspect, the present invention provides a method for removing oxygen from

ammonia gas contaminated with oxygen comprising contacting the oxygen contaminated ammonia gas with a getter material including iron and manganese that sorbs oxygen to yield ammonia that is substantially oxygen free (i.e., containing less than about 1 part per billion (ppb) of oxygen)." The applicants believe the language in paragraph 19 satisfies the written description requirement for the language "after gettering oxygen from the stream of gaseous ammonia, there is less than about 1 ppb of oxygen in said ammonia gas" of claim 85. The applicants further believe the language in paragraph 34 satisfies the written description requirement for the language "said gettering oxygen from the stream of gaseous ammonia removes more than about 99% of oxygen from said ammonia gas" of claim 86.

The Examiner asserts, with respect to claim 89 "there is no support for flowing the stream of gaseous ammonia over a dryer material." Again, the applicants respectfully disagree. In paragraph 24 of the application as published, by way of example but not limitation the applicants describe: "For example, in one embodiment, ammonia is contacted first with the getter material and then with the drying agent. Alternatively, the ammonia is contacted first with the drying agent and then with the getter material." The applicants believe the language in paragraph 24 satisfies the written description requirement for the language "flowing the stream of gaseous ammonia over a dryer material" of claim 89.

### **The 112 Rejections (Indefiniteness)**

The Examiner rejected claims 69-73 and 75-88 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

On page 2 of the Office action, the Examiner asserts, "In claim 69, line 4, there

is no antecedent basis for 'said oxides.'" The applicants respectfully disagree. Claim 69 includes the language: "thermally reducing hydroxides of iron and manganese to produce oxides of iron and manganese" and "reducing said oxides of iron and manganese..." The language "reducing said oxides of iron and manganese" has clear antecedent basis from "to produce oxides of iron and manganese."

The Examiner asserts, "In claim 79, line 4, there is no antecedent basis for 'oxygen contaminants.'" The applicants have amended claim 79 to clarify that the ammonia stream may or may not include oxygen.

The Examiner asserts, "In claim 70, it is indefinite as to what is being treated in the 'pretreatment step.'" The applicants have amended claim 70 to remove the "pretreatment step" language. The scope of the claim is believed to be broader in scope than the original claim 70.

On page 2-3 of the Office action, the Examiner asserts, "In claims 73 and 83, it is indefinite as to whether the 'hydroxides of iron and manganese' would necessarily be the 'hydroxides of iron and manganese' as recited in claims 69 and 79, respectively." The applicants have amended claim 73 to correct the inadvertently omitted antecedent basis. However, the applicants believe the Examiner has improperly rejected claim 83, since claim 79 does not include the language "hydroxides." Accordingly, the applicants respectfully request the Examiner withdraw the rejection of claim 83.

### **The 102/103 Rejections**

The Examiner rejected claim 69-73 and 75-88 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over U.S. Pat. No. 5,145,657 (hereinafter, "Kobayashi et al.").

The Examiner has made no assertion that Kobayashi et al. teach "thermally reducing hydroxides of iron and manganese to produce oxides of manganese," as recited in claim 69. The applicants have been unable to find such a teaching in the Kobayashi et al. reference.

Similarly, the Examiner has made no assertion that Kobayashi et al. teach "reducing said oxides of iron and manganese to produce an ammonia purification material, such that said purification material includes at least partially-reduced oxides of iron and manganese," as recited in claim 69. The applicants have been unable to find such a teaching in the Kobayashi et al. reference.

It should be noted that claim 4 of the Kobayashi et al. reference is as follows:

4. A method for the purification of a gas containing a component of offensive odor, selected from the group consisting essentially of hydrogen sulfide, methyl sulfide, methyl mercaptan, methyl disulfide, ammonia, methylamine, dimethylamine, trimethylamine, ethylamine, diethylamine, triethylamine, isobutylamine, pyridine, acetone, methylethylketone, butyric acid, acetaldehyde, acrolein, phenol, benzene, xylene, toluene, and butenes, which comprises combining said gas with ozone to a level of 1 to 10 mol per mol of component to offensive odor and passing the resultant mixed gas through a bed of a catalyst comprising a component A composed of 95 to 10% by weight a composite oxide containing (a) 20 to 95 mol% of TiO<sub>2</sub>, and (b) 5-80 mol% of at least one element selected from the group consisting of silicon, zirconium, and phosphorus and a component B composed of at least one element selected from the group consisting of manganese, iron, cobalt, nickel, silver, platinum, palladium, and rhodium, wherein the amount of said component B for a proportion is

in the range of not more than 150 parts by weight as oxide where said element selected is manganese, iron, cobalt, nickel, or silver or in the range of not more than 10 parts by weight as metal where said element is platinum, palladium, or rhodium, respectively based on 100 parts by weight of said component A as oxide thereby effecting decomposition and removal of said component of offensive odor by the ozone. (emphasis added).

Claim 4 of the Kobayashi et al. reference includes ammonia as a "component of offensive odor" and claims "decomposition and removal of said component of offensive odor..." Thus, Kobayashi et al. actually explicitly teach away from an ammonia purification material.

As the Examiner is undoubtedly aware, to anticipate a claim, the reference must teach every element of the claim. To establish a *prima facie* case of obviousness, the reference must teach or suggest all the claim limitations. Since Kobayashi et al. do not teach each and every element of claim 69, claim 69 is allowable over Kobayashi et al. Claims 70-73 depend from independent claim 69 and are allowable for at least the same reason as claim 69.

Claims 75-78 depend from independent claim 1 and are allowable for at least the same reason as claim 1.

Independent claim 79 is allowable for reasons similar to that of claim 69. Claims 80-88 depend from claim 79 and are allowable for at least the same reason as claim 79.

## New Claims

The applicants have added new claims 90 and 91, which depend from claim 1. No new matter has been added.

## Conclusion

Since the applicants have traversed the rejections, the applicants respectfully request that the Examiner withdraw the rejections of all claims.

A Notice of Allowance is therefore respectfully requested. Should the Examiner find that a telephone or in-person conference would expedite the prosecution of this Application further, he is invited to contact the Applicants' counsel at the contact listed below for such a conference.

Respectfully submitted,  
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